DOCUMENT RESUME

ED 122 923 PS 008 477

AUTHOR Broughton, John
TITLE The Cognitive Developmental Approach to "Epistemology" and Its Relation to Logical and Moral Stages.
PUB DATE Jul 75
NOTE 14p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Denver, Colorado, April 10-13, 1975)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Abstract Reasoning; Adolescents; Adults; *Cognitive Development; Cross Sectional Studies; *Elementary Secondary Education; Interviews; *Logical Thinking; Models; *Moral Development; *Self Concept
IDENTIFIERS *Developmental Stages; Epistemology

ABSTRACT

This paper presents a cross-sectional investigation of adolescents' and young adults' reflective epistemological development. Three groups of 8 subjects (4 male and female) ages 10, 14, and 18 were given Piagetian tasks, the Kohlberg moral judgment questionnaire, and an epistemology interview covering such concepts as knowledge, thought, feeling, subjectivity, and objectivity. Also tested were a group of 6 undergraduate students and a group of 6 postgraduates. An analysis of the interviews led to the construction of a scheme of six epistemological types or levels used to construct epistemology level scores for each subject. The levels were organized into 3 major phases: (1) the "childhood phase," (2) the "adolescent phase," and (3) or the "adult" "rational or epistemological phase." Examples are provided for each phase of epistemological development. The relationships between cognitive logic, morality and epistemology are examined. (BRT)

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John Broughton
July, 1975

THE COGNITIVE DEVELOPMENTAL APPROACH TO "EPISTEMOLOGY" AND ITS RELATION TO LOGICAL AND MORAL STAGES[1]

I am going to describe an initial cross-sectional investigation of the reflective "epistemology" of adolescents and young adults, where that involves their naive concepts of "self" and "reality", and of the "knowing" process that relates them. Starting from the cognitive-developmental account of James Mark Baldwin, and using interview methods developed by Piaget and Kohlberg, the study moves towards the definition of sequential levels in this area of "epistemology". The degree to which these levels fit empirical criteria for a cognitive-developmental account is then assessed, and also their relationship to stages of logico-mathematical thought and moral judgment. While ego development theories like Loevinger's and Van den Daele's have dealt in part with reflective conceptions of self and knowledge, only Baldwin's has made them the direct focus of a developmental scheme, and this has not yet been empirically tested. He describes the parallel development of concepts of self, mind and knowledge from an originally undifferentiated state, through a mind/body dualism to a distinction of subject and object of experience. Baldwin's stages give us a starting point from which we can try to tease out the meta-physical or epistemological strand of thought from the strictly moral strand.

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[1] Paper presented at the biennial meeting of the Society for Research in Child Development, in Denver, Colorado, April 1975.

The sample for the study contained three groups of eight subjects (4 male and 4 female) at ages 10, 14, and 18, matched for I.Q., and drawn from schools in middle-class Boston suburbs. To explore the possibility of continued development into adulthood, the sample included two further, unmatched, groups, one of 6 undergraduates, mean age 22, and the other of 6 postgraduates, mean age 26, both groups selected from a wide range of disciplines or professions.

Each subject was given Piaget pendulum, chemicals and verbal seriation tasks, a Kohlberg moral judgment questionnaire, and an epistemology interview. The latter was a semi-structured, probed interview, covering reasoning in 20 categories, derived from Baldwin, such as Self, Mind and Body, Subjectivity and Objectivity, Reality and Appearance, Knowledge, Thought and Feeling. The questions were directly aimed at eliciting <u>reflective</u> conceptions. So the kinds of questions were "What is someone's self?", "What is someone's mind?", "What things are real?" and "How do you 'know' something?"

The interviews were transcribed from tape recordings, and following Kohlberg's procedures, analysis of the transcripts led to the construction of a scheme of six types or levels (summarised in the handout). These were elaborated in a manual which could be used to give an epistemology level score to each subject.

For the sake of brevity, the levels can be summarised in terms of three phases, (Table 1) bearing an uncanny resemblance to tri-partite developmental schemes suggested by Plato, Hegel, Kierkegaard, Cassirer, and Kurt Lewin, and roughly parallel to Kohlberg's 3 levels of "preconventional", "conventional", and "postconventional".

The first, or childhood phase, is purely "objective" - that is, self,

mind, and reality just exist as physical things, automatically known by individuals through their senses. Reality is not differentiated from appearance. There is a dogmatic attitude towards truth. Here are some typical 10-year old statements at this level in response to questions about self, mind and reality respectively:

> "My self is me - my head, my hands, my body, my dinky, my sweat."
>
> "The mind is probably something like the brain or smaller. You could see it if you operate."
>
> "The tree is there. You see them. Your eyes are open. Just go and look at it and you'll know the truth."

The second, or adolescent phase, (typified by level 3 in Table 1), is "dualistic" or "sceptical". A mind/body dualism is formed between material and immaterial, and a corresponding distinction is made between "noumenon" and "phenomenon". This means that on the one hand there is the objective reality of self or world defined as inner substance or essences; while on the other, there are the outer subjective appearances concealing them. So in addition to R. D. Laing's "divided self", there is also a "divided world" of reality and appearance.

Here are two quotes about mind, body and self:

> "The mind is what you do in your brain. Like, you think. The brain is the matter itself. The mind is more the energy thing...Like gasoline makes a car engine work."
>
> "The body for me is just the appearance, is just a shadow. It's the living force inside, you know, the ideas that emanate, that are the self...You can misjudge the person because the body is just a representation, an appearance

> for the self...The mind is inside the shell of the tangible body, which tends to conceal the private inside."

Another example from this second phase shows the new subjective quality of mind, which means that the senses now become fallible, and observations need social corrobation:

> "Maybe I want to see it so bad, that I see it even when it's not there. Somebody will say 'It's not there', when you say 'Look!'. Base it on someone else's opinion."

In between the second and third phases intervenes a transitional period of extreme relativism or solipsism, where the substantial existence of both self and reality is reduced to mere subjective appearance, and even a truth by consensus loses its appeal because this becomes an arbitrary social convention. A good sample of this phase is a comment from a bright high-school senior, who sees reality as subjective self-realisation:

> "Reality is my own belief. If I think someone likes me then that's real even if society says it isn't. It's real because I am using my consciousness. And that is real. There's no absolute truth. It's an expression of self, revealing your truth, an element of yourself... Nixon is a rat to those who feel he is a rat."

The important notions of "reflection" and "consciousness" emerging here are developed in a more "objective" direction in the third or adult phase proper, which we can call "rational", or "epistemological", i.e. mind becomes constitutive of knowledge, and knowledge becomes a shared rational system interpreting experience, and presupposing a universal reflective human self. Mental and physical are parallel aspects of this experience, rather than being reified as separate substances. And "subjectivity/

objectivity" is a distinction within self or experience, rather than a distinction between "inner mind" and "outer reality". By getting rid of the "copy theory of knowledge", in which we try to make mental models of reality and ourselves, truth comes to rest in the methodological principles or criteria underlying our judgments, and so the possibility of objective knowledge is restored. Here are some examples of these conceptions:

> The self is "the subject of experience, which... is merely the point which experiences everything. There is no experience without a subject of experience... It is totally incoherent that I might not be having my experiences." "I would not have a sense of myself as a subject of experience, or as a person, if I didn't have a sense of the world being there."
>
> "Mind is not a thing. It just brings together descriptions of mental processes, mental ways of talking... Mental and physical are two different systems of description describing me, or my brain. Each have their own laws... They are parallel descriptions of what is happening."
>
> "Subjectivity refers to that aspect of experience which a person brings to experience. (Objectivity is) when it meets those criteria which we have established for truth in that particular area... We get this distinction of subjective and objective because of our experiencing of experience."

Having constructed a detailed and reliable coding system for epistemology levels according to this scheme, the question came up "How does it fit with standard criteria for identifying cognitive-developmental domains of thought?" Without longitudinal data it made no sense to apply Piaget's or Kohlberg's strict criteria for "stage" and "sequence" to the results.

So the following empirical requirements were set up as necessary (but not sufficient) for saying that natural epistemology is a cognitive-developmental domain like logico-mathematical thought or moral judgment.

The first criterion was that the hierarchy of levels should be age-related. Differences between the adjacent matched age-groups were significant at the .02 level. The correlation of epistemology level with chronological age was .77, significant at the .01 level. This correlation was in fact found to be totally mediated by mental age; in other words, the partial correlation with CA, holding MA constant, was zero. This at least supported the idea that epistemology level was a measure of cognitive maturity rather than simply aging.

The second criterion was that, if epistemology is a coherent cognitive realm, subjects' thought should show quite a bit of internal consistency. The average deviation of sub-scores from the mean score ascribed to the interview was found to be one quarter of a stage. This is equivalent to having 55% of the sub-scores at the same level, 28% in the transitions to and from that level and 16% at one of the adjacent levels. Leik and Matthews' scaling measure for scoring at adjacent levels yielded a highly significant coefficient of .90 ($p<0.0001$). Only a small fraction of this empirical consistency was found to be due to the halo effect of scorer's bias toward self-consistent scoring. Inter-correlations between Self, Mind, and Knowledge sub-scales fell between .89 and .92, whereas each subscale correlated only about 0.7 with logical or moral stage.

The third criterion was that epistemology levels should show, within subjects, a systematic qualitative relationship with levels in cognitive domains already established as stage-sequential. This was the main purpose of administering Piaget tests and Kohlberg questionnaires. Theoretical

correspondences between levels in all three domains were set up in advance, in order to define what would qualify as"synchronous"development(see tables 2 and 3). This was done by logical analogy. For example, early formal operations, Piaget's '3A', was construed as corresponding to epistemology level 3, because the early conception in terms of closed systems (involving the inverse of the reciprocal) is a logical component of the notion of a substantial self or reality behind appearances. Epistemology level 3, in turn, was taken as corresponding to moral stage 4. This is because the latter is based on a "substantial" or systematic conception of society. These and other correspondences are indicated by shaded intersects in tables 2 and 3.

When the parallels were set up in this fashion, contingency tables showed a tendency towards overall synchrony within subjects, who fall on or around the shaded diagonal. 26 out of 36 show exact synchrony for epistemological/logical, and 14 out of 36 for epistemological/moral. Where there was asynchrony, it tended to be in the same direction: logical development advanced ahead of epistemological development (all 10 of the asynchronous cases), and epistemological development advanced ahead of moral (20 out of the 22 asynchronous cases). Described in this way, the within-subjects contingencies suggest that reaching a given logical stage is necessary but not sufficient for attainment of the corresponding level of natural epistemology, which in turn is necessary but not sufficient for reaching the corresponding stage of moral judgment. This would make theoretical sense , since epistemology reflects upon thought or logic, defining what "is", and morality adds to this further

considerations of what "ought" to be.

However, there are other less sanguine ways to interpret these contingency tables. For example, the"asynchronies" may just reflect errors in the a priori logical analogies. The word "logical" should not be taken to imply "not empirically revisible". On the other hand apparent asynchronies could be the result of confusions in the scoring system. In table 3, this could suggest inadvertent overlap in the defintions of epistemology levels 1 and 2, and 2 and 3. Scoring reliability measures indicate that this is feasible for 1 and 2 (where there were indeed instances of confusion), but not for 2 and 3 (where there were relatively few). Test/retest data would also be relevant here, and this is now being collected.

The conclusion is, that with a small sample size, and no test/retest data, there are reasons to reserve judgment about the relation of cognitive logic, morality and epistemology. It appears that the interpretation of this kind of cross-sectional within-subjects contingency data involves complicated problems.

However, the data obtained is at least compatible with the original suggestion, that a coherent domain of cognitive epistemology exists that is not reducible to either logical or moral thought. This points to the possibility of teasing out the rational and existential strand of cognitive development from the ethical strand. Ego development theories have typically dealt with "values", a general term pitched at the level of abstraction where moral and epistemological are no longer distinct. One of the possible confusions that this can give rise to is that between "first-order" and "second-order" thinking. Natural epistemology is a more reflective order of thought than moral judgment, i.e. it involves a reflection upon the nature and validity of thought or judgment itself.

Separating out this reflective dimension from ego development as a whole may shed some light on the relation of ego development to moral development. Loevinger has argued that ego and moral development are synchronous. On the other hand, Kohlberg has said that ego development is the broad context within which narrower moral development occurs, and that

> "certain features of ego development are a necessary but not sufficient condition for development of moral structures."

If epistemology represents one such feature, other more value-oriented aspects of the ego may develop in parallel with moral judgment, as Loevinger suggests.

Future research in this area will attempt to define more structural levels in epistemology through broader cross-sectional study, and longitudinal follow-up of the original sample. In addition, since Byrne[2] has found that social perspective-taking bears similar contingent relationships to logic and moral judgment as those reported here for epistemology, clarifying the relation of epistemology and perspective-taking becomes an important theoretical issue and empirical task for an integrated cognitive-developmental approach to physical and social concepts. Because epistemological development represents the progressive differentiation and integration of concepts of subject and object, its description must play some role in the integration of Piaget's "logic of objects" with Kohlberg's "logic of subjects."

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2 Byrne, D. Role-taking development in the years from ten to adulthood. Unpublished doctoral dissertation, University of Rhode Island, Providence.

Table 1

SUMMARY SCHEME OF LEVELS OF EPISTEMOLOGY

	A. SELF	B. MIND AND BODY	C. KNOWLEDGE, TRUTH AND REALITY
Phase I - Late childhood			
1. OBJECTIVE	Self is physical body containing thoughts. Self changes as body moves or thoughts change.	Mind differentiated from brain, but both still bodily organs. Thoughts are invisible, but not yet a mental substance.	Reality is absolute - the visible or tangible. Knowledge is atomistic and dogmatic "answers."
Phase II - Adolescence			
2. SUBJECTIVE	Self is mind (+ body). True self is unique ideas and conscious individuality, differentiated from false outer, social self (i.e. the "divided self").	Mind is will and opinion, voluntary control of reality ("mind over matter"). Mental/physical dualism of substances. Mental differentiated from individual minds.	Reality is mental and physical existence. Truth is either matters of belief, or fact (sense-data). Knowledge is individual, unshared opinion about facts.
3. SPIRITUAL	Self is system, 'person,' or soul, as a substance differentiated from and underlying mental and physical parts. Conscious self differentiated from unconscious.	Mental/physical interaction, combined with spiritual platonism (belief in essences or ideal concepts). Mind differentiated from self as shared mental faculty.	The real is differentiated as the objective 'essence' behind subjective appearance. Reality is induced from interpersonal agreement, and includes the non-sensible. Knowledge is fallible. Concrete and abstract distinguished.
4. POSITIVIST	Self is self-concept, or the 'generalized other's' concept of self. (The "looking-glass self").	Mind is epiphenomenal illusion or error, awaiting reduction to the scientific physico-chemical level.	Knowledge is scientific system of the hypothetico-deductive kind, generating laws which 'model' fixed and lawful reality (copy theory of knowledge). Reality is impersonal objectivity guaranteed by scientific method (observation and induction).

Transitional phase

4 1/2. SOLIPSIST	Self is process, or consciousness. It is what you make of it (self-realization). Self is situationally determined and in flux.	Mental-physical experience differentiated from mind and body. Monistic determinism.	Solipsism: all knowledge is consciousness or experience, and hence ultimately self-knowledge. Reality is reduced to its concrete particulars - the flux of sensation. Objectivity is reduced to subjectivity, reality to appearance.

Phase III - Young adulthood

5. EPISTEMOLOGICAL	Experience differentiated into subject-self and object-self, which it presupposes. Self is the general epistemological quality of rational self-consciousness or reflection on subject/object relations.	Mind as function differentiated from mental substance. Mental and physical as parallel psychology and physiology, systems of general explanatory laws, which are themselves objects of thought. 'Mental versus physical' is a relative distinction within experience.	Subjectivity and objectivity defined relative to one another within experience. Reality defined as a metaphysical system. Truth differentiated from reality as universalisable process of reflective judgment, or general meaning. Knowledge as epistemological, dependent upon universally sharable system of interpretation.

TABLE 2 - Joint matrix for epistemology level and logical stage

Epistemology level	2A	2B	3A	3B	Totals
5/6				2	2
5				3	3
4½				4	4
4				1	1
3			3	4	7
2	1	7	3	1	12
1	5	1	1		7
Totals	6	8	7	15	36

Concrete | Formal

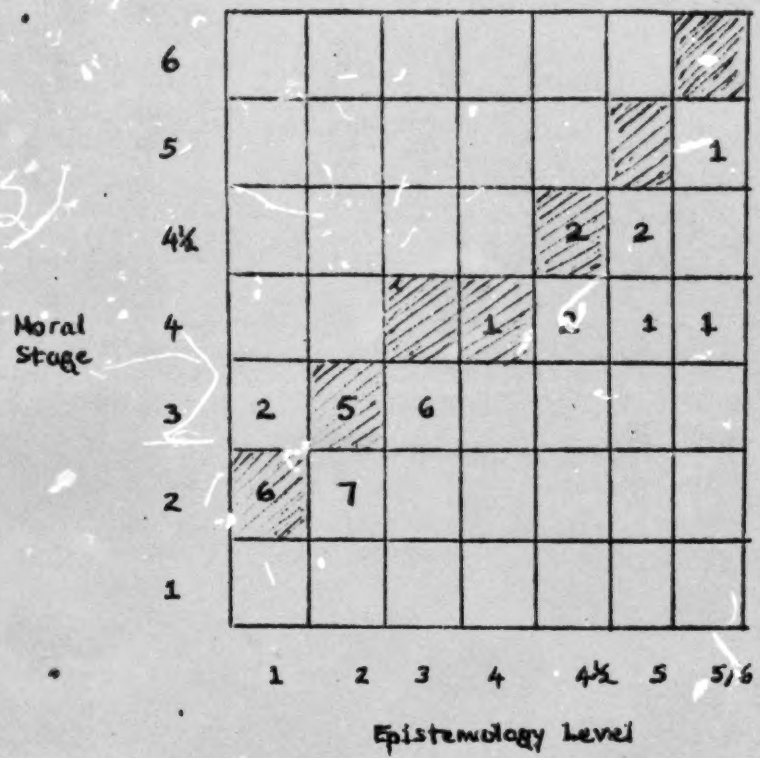
Piaget stage of operational logic

$\chi^2 = 12.43$ ($\nu=1$)
($p<0.001$)

	+		−
	L=E	L>E	E>L
	[11]	[16]	[19]
	26	10	0

$\chi^2 = 31.65$ ($\nu=2$)
($p<0.0005$)

TABLE I - Joint matrix for epistemology level and moral stage



$\chi^2 = 5.24$ (v=1)
(p<0.02)

+		−
E=M	E>M	M>E
19	19	19
14	20	2

$\chi^2 = 8.44$ (v=2)
(p<0.02)